

## **WHAT IS CLAIMED IS:**

1. A sample trap for a detection apparatus, said trap being formed from a reticulated open cell foam of an aluminum alloy with a thickness of less than 10mm.
2. The trap of claim 1, wherein the trap has a thickness of approximately 2mm.
3. The trap of claim 2, wherein the trap has a density of between about 10% and 15% of the aluminum alloy in an unfoamed condition.
4. The trap of claim 1, wherein the reticulated open cell foam has a mean cell size of between about 0.170 inch and 0.020 inch.
5. The trap of claim 1, wherein the reticulated open cell structure of the foamed aluminum alloy has between 5 and 40 pores per inch.
6. An apparatus for testing whether an object contains a substance of interest, said apparatus comprising:
  - a testing station for receiving the object to be tested;
  - a foamed metal trap having a reticulated open cell structure and disposed for receiving a flow of air from the testing station;
  - a heater for heating the foamed metal trap sufficiently to volatize material on the trap;
  - an air pump for generating a flow of air across the trap; and
  - a detector for receiving the flow of air across the trap and for testing whether the flow of air across the trap contains any of the particles of interest.
7. The detector of claim 6, wherein the trap has a thickness of less than 10mm.

8. The detector of claim 6, wherein the trap has a thickness of approximately 2mm.

9. The detector of claim 6, wherein the trap is formed from a foamed aluminum alloy.

10. The detector of claim 9, wherein the aluminum alloy has a selected density, and wherein the trap has a density of 10%-50% of the aluminum alloy.

11. The detector of claim 9, wherein the detector is an ion mobility spectrometer.

12. The apparatus of claim 9, wherein the detector is an ion trap mobility spectrometer.

13. The detector of claim 6, wherein the trap is formed from foamed copper metal.

14. The detector of claim 6, wherein the trap is formed from a stainless steel metal.

15. The detector of claim 6, wherein the trap is formed from a silica-carbon foam metal.

16. A method for forming a trap for collecting trace amounts of particles of interest, said method comprising providing an aluminum alloy;

foaming the aluminum alloy to define a reticulated open cell structure having a thickness of at least 10mm; and

compressing the foamed aluminum to a thickness of about 2mm.

17. The method of claim 16, wherein the trap is compressed by placing the foamed material in a press.

18. The method of claim 16, wherein the foamed aluminum is compressed by passing the foamed aluminum through a nip between a pair of rollers.